

REMARKS

Claims 1-3 are all the claims pending in the application. All the claims stand presently rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 11326194 in combination with Yee et al (US Patent No. 5,822,073) and in further view of Kempen (US Patent No. 6,594,011).

On page 3 of the present Office Action, the Examiner states that the JP 11326194 reference substantially teaches the claimed invention except that a semiconductor light emitting element that emits light by super radiance is employed as the light source. However, the Examiner continues by stating that “Kempen ('011) shows that it is known to provide a semiconductor light emitting element that emits light by super radiance ... as the light source (Col. 5, ln. 11-16) for a surface plasmon apparatus.”

The JP 11326194 reference shows a surface plasmon sensor that includes a prism 10 and a metallic film 12 formed at one face of the prism 10 so as to contact a sample 11. Furthermore, the surface plasmon sensor has a light source 14 for generating a light beam 13; an optical system 15 for passing the light beam 13 through the prism 10; and photodetecting means 17 for detecting the light beam 13 that is totally reflected at an interface 10a between the prism 10 and the metallic film 12.¹

¹ See Abstract of JP 11326194

As taught in the application, in metals, if free electrons are caused to vibrate in a group, compression waves called plasma waves are generated. The compression waves generated in a metal surface are quantized into surface plasmon.²

In a surface plasmon resonance sensor, if a light beam strikes the metal film at a specific incidence angle equal to or greater than an angle at which total internal reflection occurs, evanescent waves having an electric field distribution are generated in the sample that is in contact with the metal film. Thereby, surface plasmon is excited in the interface between the metal film and the sample. When the wave vector of the evanescent light is equal to the wave number of the surface plasmon and, therefore, the wave numbers between the two match, the evanescent waves and the surface plasmon resonate and light energy is transferred to the surface plasmon. Thereby, the intensity of light satisfying total internal reflection at the interface between the dielectric block and the metal film drops sharply. The sharp intensity drop is generally detected as a dark line by the photodetection means.³

From the background discussion of surface plasmon sensors above, it is clear that a metallic film (such as the metallic film 12 between the prism 10 and the sample 11 in the JP 11326194 reference) is an essential feature for the proper operation of a surface plasmon sensor.

² See application text, page 1, ln. 13-16

³ See application text, page 2, ln. 24, to page 3, ln. 12

Fig. 2 of the Kempen reference shows a polarized light source assembly 12 that has, among other things, a light source 26. A total internal light reflection assembly 14 has an optical element 34 having an optical surface 36. Also shown is a specimen slide 38 on the optical surface 36. An index matching substance 40 is arranged between the optical surface 36 and the specimen slide 38. Because of the index matching, a total internal reflection surface (TIR surface) is defined as an upper surface 39 of the specimen slide 38. A specimen 42 is arranged on the total internal reflection surface 39 of the slide 38.⁴

As noted by the Examiner, the light source 26 of the polarized light source assembly 12 can be an SLD (Super Luminescent Diode).⁵

Unlike the JP 11326194 reference, however, the Kempen reference is not directed to surface plasmon sensors. In fact, there is no teaching or suggestion anywhere in the Kempen reference of a metallic film between the optical element 34 and the specimen 42. Instead, as noted above, the Kempen reference merely discloses that the optical element 34 has an optical surface 36; that a specimen slide 38 is arranged on the optical surface 36; and that an index matching substance 40 is arranged between the optical surface 36 and the specimen slide 36.

Therefore, there is no teaching or suggestion in the prior art made of record that would have motivated a person skilled in the art to utilize the SLD 26 of Kempen's "non-surface-plasmon-sensor" as the light source 14 of the surface plasmon sensor disclosed the JP 11326194

⁴ See Kempen reference, col. 4, ln. 20-48

⁵ See Kempen reference, col. 5, ln. 11-16

RESPONSE UNDER 37 C.F.R. § 1.111
US Appln. No. 10/025,972

reference. Consequently, Applicant submits that a person skilled in the art would not have been motivated to combine the disclosure of the JP 11326194 reference with the disclosure of the Kempen reference so as to arrive at the claimed invention.

In addition, referring to independent claim 3, Applicant notes that none of the JP 11326194 reference, the Kempen reference, and the Yee reference teaches or suggests “an optical waveguide layer, formed on said cladding layer, for placing a sample thereon”, as recited in claim 3.

For at least these reasons, Applicant submits that claims 1-3 are patentable over the prior art made of record.

Furthermore, Applicant notes that Kempen discloses a method regarding ellipsometry, in which a polarizing state is utilized, as shown in the Abstract of Kempen. Hence, the method disclosed in Kempen differs from the method of the present invention, in which attenuated total reflection is utilized.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

RESPONSE UNDER 37 C.F.R. § 1.111
US Appln. No. 10/025,972

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Paul F. Neils", written over a horizontal line.

Paul F. Neils
Registration No. 33,102

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

PFN/AXP/plr
Date: November 28, 2003